

REMARKS

This Amendment, filed in reply to the Office Action dated February 2, 2007, is believed to be fully responsive to each point of rejection raised therein. Accordingly, favorable reconsideration on the merits is respectfully requested.

Claims 1-38 are all the claims pending in the application.

I. Claim Rejections under 35 U.S.C. § 112

Claim 9 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant hereinabove amends claim 9 to obviate this rejection.

II. Claim Rejections under 35 U.S.C. § 102

Claims 1-3, 6, 11, 12, 27, 28, 31, 36 and 38 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Suzuki et al. (U.S. Patent No. 6,547,361). Applicant submits that as amended, claim 1 describes detecting whether or not a print defect occurs based on whether a difference between recorded data and reference data exceeds a predetermined threshold. To the extent that Suzuki may correct for print defects, the correction is based on a ratio of the actual data density and the expected print density. The print signal is then corrected against the density ratio. See Suzuki col. 19, lines 8-24. The correction based on the ratio does not necessitate the difference determination and comparison with the threshold as described by independent claim 1. Therefore, claim 1 is patentable for at least this reason.

Because independent claims 11, 16 and 19 include similar recitations, these claims are patentable for analogous reasons set forth for claim 1. The new secondary reference Schantz

'720 does not make up for this deficiency. Claims 22 and 24 are patentable based on similar recitations.

III. Claim Rejections under 35 U.S.C. § 103

Claim 4 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Suzuki et al. (U.S. Patent No. 6,547,361) in view of Aosaki et al. (U.S. Patent No. 5,467,198). Claim 4 is patentable based on its dependency on claim 1, and Aosaki does not make up for the deficiency of Suzuki. Though the Examiner characterizes Suzuki as directed to a generic printer, it is clear that Suzuki relates to an ink jet device. See cols. 1-2. Because of the radiant effects of a thermal printer, one skilled in the art would not expect the teachings of Aosaki to be combinable with the ink-jet correction mechanisms of Suzuki.

At page 3 of the Office Action, the Examiner acknowledges that a printing defect of ink jet printers and thermal printers are different. However, the Examiner nonetheless states that the corrective measures of the ink jet printer in Suzuki would be applicable to the thermal printer of Aosaki. Applicant submits that the use of the corrective density ratios in Suzuki would not provide correction in the thermal printer of Aosaki. This is because thermal printers rely on heating in excess of a temperature threshold in order to begin any thermal reactions. See, e.g. binarization requirements, col. 7, lines 36-44. The density ratios of Suzuki do not necessarily lend themselves to the quantum of heating that would be necessary to impart the thermal reactions in a thermal head printer. Therefore, the references do not lend themselves to combination as the Examiner contends. Claim 4 is patentable for this additional reason.

Claim 5 stands rejected under 35 U.S.C. § 103 over Suzuki in view of Saito (U.S.P. 4,561,789). The Examiner's rejection with regard to the combination of Suzuki and Saito suffers the same deficiencies as the combination of Suzuki and Aosaki as described above. In particular, the printing mechanisms of Suzuki and Saito differ in a fundamental way. Saito relies on sublimation of a printing ink, which will occur once a certain heating threshold is exceeded. See Col. 7, lines 38-65. Thus, the density correction ratios of Suzuki would not necessarily lend themselves to a temperature rise that would lead to sublimation. Therefore, claim 5 is patentable for this additional reason.

Claims 7, 9, 10, 29 and 37 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Suzuki et al. (U.S. Patent No. 6,547,361) in view of Takanaka (U.S. Patent No. 6,347,855). Applicant submits that independent claim 7, as previously pending, also includes corrections based on a density difference as described for claim 1. Because Suzuki uses a corrective density ratio, Suzuki does not teach each feature of claim 7, and Takanaka does not correct for this deficiency.

Additionally, with regard to claim 7, the Examiner correctly concedes that Suzuki does not teach a density measuring means for detecting density during a backward scan and performing correction when moved forward. The Examiner cites Takanaka at col. 20, lines 13-30 to teach this feature. However, it is noted that Takanaka appears to teach defect detection based on a particular defect-detecting pattern prior to printing of a line. See Flowchart Fig. 14A, Steps S101-S106 and S118. If a defect is detected, then the correctional offsets of the printing rows are adjusted to compensate for the error as detected in the defect detection pattern.

However, the defect detection pattern itself is not corrected, but rather forward printing is executed based on the correction information for the actual data being printed. See Fig. 14A (S107-S110) and Fig. 14B (S141-S113). Therefore the correction does not relate to the density defect region.

In Takanaka, if a correction needs to be made, it is made on a reverse scan. See Fig. 14B (S115). Therefore, Takanaka does not teach a recording correcting means for performing a recording (error recording) having the defective portion for said density difference. This is because in Takanaka the defective portion is detected in a separate pre-printing error detecting step. Any defect is corrected for a different region by an offset of the print element row in the actual data to be printed (as opposed to the defect pattern).

Moreover, the density correction of any defect in Takanaka appears to be performed on a reverse scan (See Fig. 14B, S115). By contrast, claim 7 describes correction for the forward scan.

In addition, claim 7 describes a density measurement on a reverse carriage movement. The direction of the carriage movement during density measurement is not clear in Takanaka. The Examiner relies on Col. 20 to teach this feature. The cited portion suggests that a backward defect detection is accompanied with a backward scan for complementary (corrective) printing. However, claim 7 describes the reverse density measurement in conjunction with a forward correction. None of the embodiments of Takanaka teach this combination. Therefore, claim 7 is patentable for at least these reasons. The remaining claims 9-10, 29 and 37 are patentable based on their dependency.

Furthermore, claim 37 describes that the processes occur during a common recording operation. However, it is clear from Figs. 14A-14B of Takanaka that error determinations occur for a defect print pattern and corrections occur for a separate line pattern. Therefore, claim 37 is patentable for this additional reason. These are two different recording operations using discrete data.

Claims 8,9,10 and 30 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Suzuki et al. (U.S. Patent No. 6,547,361) in view of Noyes (U.S. Patent No. 6,775,022). Applicant submits that independent claim 8 also includes corrections based on a density difference as described for claim 1. Because Suzuki uses a corrective density ratio, Suzuki does not teach each feature of claim 8, and Noyes does not correct for this deficiency.

Furthermore, the Examiner correctly concedes that Suzuki does not teach density measurements when a head is moved backwards. The Examiner cites various sensors of Noyes, including references to cols. 16-17 and col. 86. The citations at cols. 16-17 do not support the rejection because they relate to temperature sensors and the status indicators for the open or closed state of a printer door. None relate to density and none are required to operate on the backward scan. The Examiner's reliance on col. 86 is similarly deficient as it relates to early warning for ink smear. This, however, is not necessarily performed on a backward scan.

The Examiner also contends that Noyes discloses claimed second measuring means. Applicant respectfully disagrees. Noyes is directed to alignment of print heads and is not concerned with measuring a density for correction recording of print defect generated on the recording sheet. Therefore, Noyes doesn't clearly suggest the feature of the second density

measuring means of obtaining a measured density of a recorded portion just after recording when said carriage is moved backward. Therefore, claim 8 is patentable for at least these reasons.

Claims 10 and 30 are patentable based on their dependency.

Claims 13-15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Suzuki et al. (U.S. Patent No. 6,547,361) as applied to claim 11 and in further view of Tanaka et al. (U.S. Patent No. 6,123,341). Claims 13-15 are patentable based on their dependency on claim 11, as Tanaka does make up for the deficiencies of Suzuki.

Claims 16-21 and 32 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Suzuki et al. (U.S. Patent No. 6,547,361) and in further view of Schantz (U.S. Patent No. 5,124,720). Independent claims 16 and 19 are patentable for the reasons set forth above for claim 1, as Schantz does not make up for the deficiencies.

Claims 22 and 23 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Suzuki et al. (U.S. Patent No. 6,547,361) and in further view of Yamaguchi et al. (U.S. Patent No. 5,424,764).

The Examiner correctly concedes that Suzuki fails to teach discharging the sheet of the image and resetting the material to the printer again. The Examiner cites Yamaguchi to teach this feature. As an initial matter, one skilled in the art would not combine the teachings of the thermal printer of Yamaguchi with the ink jet printer of Suzuki for the reasons explained in connection with claims 4-5.

The Examiner contends that it would be obvious to combine the teachings of Suzuki and Yamaguchi in order to reduce the amount of wasted sheets. However, the Examiner's rationale

is not supportable. This is because Suzuki purports to correct such errors before discharge from a printer. There would not be wasted sheets when such errors are corrected prior to discharge.

Even assuming arguendo that the references may be combined, Yamaguchi does not teach the medium discharge as claimed. Though the Examiner cites to col. 2 of Yamaguchi, the cited portion merely describes recording at two levels for certain effects on a thermal paper. To the extent that erasures occur to correct an output on the medium, these are not attributable to defects on a row. Rather, these may be corrections of data purposefully imparted to the medium but later desired to be erased. Therefore, claim 22 is patentable for at least this reason. Claim 23 is patentable based on its dependency.

Claims 22 and 34 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Schantz and in further view of Yamaguchi et al. (U.S. Patent No. 5,424,764). The rejection of claim 22 over a combination including Yamaguchi is set forth above in the discussion of the rejection over Suzuki and Yamaguchi. Schantz does not correct for any of these deficiencies.

Claims 24 and 35 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Suzuki et al. (U.S. Patent No. 6,547,361) and in further view of Ui et al. (U.S. Patent No. 6,340,984). Applicant submits that independent claim 24 also includes corrections based on a density difference as described for claim 1. Because Suzuki uses a corrective density ratio, Suzuki does not teach each feature of claim 24, and Ui does not correct for this deficiency.

Claims 25 and 26 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Suzuki et al. (U.S. Patent No. 6,547,361) and Ui et al. (U.S. Patent No. 6,340,984) as applied to claim 24, and in further view of Noyes (U.S. Patent No. 6,775,022). Claims 25-26 are patentable

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Application No.: 09/855,943

Attorney Docket No.: Q64477

based on their dependency on claim 24. Noyes does not make up for the deficiencies of the primary combination.

Claim 33 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Suzuki et al. (U.S. Patent No. 6,547,361) and Schantz (U.S. Patent No. 5,124,720) as applied to claim 20, and in further view of Applicant's admitted prior art. Claim 33 is patentable based on its dependency on base claims 19-20. The admitted prior art does not make up for the deficiencies of the primary combination.

Claim 39 is added to describe the invention more particularly.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,


SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE

23373

CUSTOMER NUMBER

Date: May 2, 2007


Susan P. Pan
Registration No. 41,239